

Title (en)  
SHAPED CHARGE LINER AND SHAPED CHARGE INCORPORATING SAME

Title (de)  
HOHLLADUNGSEINLAGE UND HOHLLADUNG DAMIT

Title (fr)  
REVÊTEMENT DE CHARGE CREUSE ET CHARGE CREUSE COMPORTANT LEDIT REVÊTEMENT

Publication  
**EP 3568664 B2 20240228 (EN)**

Application  
**EP 17835626 A 20171215**

Priority  

- US 201762445672 P 20170112
- US 201762488182 P 20170421
- US 201715499408 A 20170427
- EP 2017082974 W 20171215

Abstract (en)  
[origin: US9862027B1] A shaped charge liner including a composition of powders. The composition may include one or more of an aluminum metal powder and a titanium metal powder, a bronze metal powder, a tungsten metal powder and a graphite powder. Each powder of the composition may include grain size ranges that are different from one or more other powder grain size ranges. The bronze metal powder may include two or more different grain size ranges, and in some instances three or four different grain size ranges. A method of making the shaped charge liner and shaped charge with such liner having the composition of powders is also disclosed, as is a shaped charge including such shaped charge liner.

IPC 8 full level  
**F42B 1/032** (2006.01)

CPC (source: EP US)  
**B22F 1/05** (2022.01 - EP US); **B22F 3/06** (2013.01 - US); **B22F 3/093** (2013.01 - US); **B22F 3/16** (2013.01 - US); **B22F 5/106** (2013.01 - US); **E21B 43/117** (2013.01 - US); **F42B 1/032** (2013.01 - EP US)

Citation (opposition)  
Opponent :

- EP 3144630 A1 20170322 - QINETIQ LTD [GB]
- EP 3144629 A1 20170322 - QINETIQ LTD [GB]
- EP 2598830 A1 20130605 - QINETIQ LTD [GB]
- Third party observations of QinetiQ of 20 Aug 2019 against the application of the opposed patent
- Third party observations of QinetiQ of 20 Feb 2019 against the application of the opposed patent
- Third party observations of QinetiQ of 26 May 2020 against the application of the opposed patent.
- D E EAKINS, N N THADHANI: "Shock compression of reactive powder mixtures", INTERNATIONAL MATERIALS REVIEWS, ASM INTERNATIONAL, MATERIALS PARK, US, vol. 54, no. 4, 1 July 2009 (2009-07-01), US, pages 181 - 213, ISSN: 0950-6608, DOI: 10.1179/174328009X461050
- PHILIP CHURCH ET AL.,: "Investigation of a Nickel-Aluminium reactive Shaped Charge Liner", JOURNAL OF APPLIED MECHANICS, vol. 80, no. 3, 1 May 2013 (2013-05-01), pages 031701 - 031701-13
- Opposition Division's Decision on D7 following oral proceedings of 11 November 2017

Cited by  
US11499401B2; US11591885B2; US11661824B2; US11795791B2

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)  
**US 9862027 B1 20180109**; CA 3048505 A1 20180719; CA 3048505 C 20210302; EP 3568663 A1 20191120; EP 3568664 A1 20191120; EP 3568664 B1 20201111; EP 3568664 B2 20240228; US 10376955 B2 20190813; US 2018193909 A1 20180712; WO 2018130368 A1 20180719; WO 2018130369 A1 20180719

DOCDB simple family (application)  
**US 201715499408 A 20170427**; CA 3048505 A 20171215; EP 17828873 A 20171215; EP 17835626 A 20171215; EP 2017082970 W 20171215; EP 2017082974 W 20171215; US 201715831830 A 20171205